Second Five Year Review Report

Old Springfield Landfill Superfund Site

September 2003

Old Springfield
48677

Five-Year Review Report

Second Five -Year Review Report
for
Old Springfield Landfill Superfund Site
Springfield, Vermont

September 2003

PREPARED BY:

United States Environmental Protection Agency
Region 1
Boston, Massachusetts

Approved by: Date:

Susan Studlien
Susan Studlien, Acting Director
Office of Site Remediation and Restoration

September 26, 2003

Table of Contents
Five-Year Review Report
Old Springfield Landfill Superfund Site
Springfield, VT

TABLES

ATTACHMENTS

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name: Old Springfield Landfill Superfund Site		
EPA ID: VTD000860239		
Region: 1	**State:** VT	**City/County:** Springfield/Windsor

SITE STATUS		
NPL Status: **X** Final	Deleted	Other (specify)
Remediation Status (choose all that apply)**:** Under Construction	Operating	Complete **X**
Multiple OUs? **X**Yes No	**Construction completion date:** 09/22/1994	
Has site been put into reuse? Yes	**X** No	

REVIEW STATUS	
Lead Agency: **X** EPA State Tribe Other Federal Agency _____	
Author name: Edward Hathaway	
Author title: Remedial Project Manager	**Author affiliation:** U.S. Environmental Protection Agency
Review Period: 9/29/1998 to 9/30/2003	
Date(s) of inspection: 05/21/2003	
Type of Review: **X**Post-SARA Pre-SARA NPL-Removal Only Non-NPL Remedial Action Site NPL State/Tribe-lead Regional Discretion	
Review number: 1 (first) **X** 2 (second) 3 (third) Other (specify) _____	
Triggering Action: Actual RA Onsite Construction at OU #_____ Actual RA Start at OU#_____ Construction Completion Other (specify) Signing of ROD **X** Previous Five-Year Review Report	
Triggering action date (from WasteLAN): 09 / 29 / 1998	
Due date (five years after triggering action date): 09/ 29 / 2003	

* ["OU" refers to operable unit.]

Five-Year Review Summary Form, cont'd.

Issues:

There are no major issues to be addressed. EPA and Vermont ANR will continue to perform periodic inspections to indicate areas where maintenance may be necessary.

Recommendations and Follow-up Actions:

The recommendation and follow-up actions involve the continued oversight of the work being performed by the PRPs to assure compliance with the consent decree and Records of Decision requirements.

Protectiveness Statement:
Because the remedial actions at this Site are protective, the Site is protective of human health and the environment.

- There is no current exposure of Site related waste to humans or the environment at levels that would represent a health concern.
- The landfill cover system prevents exposure to the waste material and contaminants with the landfill.
- The groundwater extraction system prevents the migration of the contaminated groundwater towards Seavers Brook.
- The water line has eliminated groundwater use within the area impacted by the landfill. The small quantity of contaminated groundwater that may be reaching the Black River is rapidly diluted by the flow of the Black River.
- PCBs and other constituents that would present a threat to biota in the Black River are not longer available for transport to the Black River via erosion as a result of the landfill cover.
- Landfill gas is treated with carbon drums and testing has confirmed that the levels do not represent an unacceptable risk.
- Extracted groundwater is being successfully treated by the groundwater treatment system and discharged in compliance with the NPDES permit.

The long-term protectiveness of the remedy will continue to be verified through monitoring and routine site inspections, which are included as part of the site's operation and maintenance activities.

Old Springfield Landfill Five Year Report

1.0 Introduction

A second five-year review was conducted of the remedial actions selected for the Old Springfield Landfill, in Springfield, Vermont. The purpose of the five-year review is to determine whether the remedy being implemented at the Site remains protective of human health and the environment. The methods, findings, and conclusions of the five-year review are documented in this Five-Year Review Report. In addition, this report presents issues identified during the review and provides recommendations to address them.

This Five-Year Review Report was prepared pursuant to CERCLA §121 and the National Contingency Plan. CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that the action is appropriate at such site in accordance with section [104] or [106], the president shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR § 300.430 (f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the second five-year review for the Site. The triggering action for this statutory review is the completion of the last five-year review in 1998. The five-year review is required due to the fact that contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

2.0 SITE CHRONOLOGY (TABLE 1)

DATE	EVENT
1947	Approximate time period for the initiation of the waste disposal activities.
1968	Dump was closed and converted into a mobile home park.
12/82	Site added the National Priorities List.
1984	PRPs install a water line.
6/88	Remedial Investigation report completed.
6/88	Operable Unit I (OU I) Feasibility Study completed.
9/22/88	EPA issued a Record of Decision (ROD) for OU I of the Site.
3/89	EPA enters into Administrative Order with PRPs to perform Operable Unit II (OU II) Feasibility Study.
9/89	EPA and PRPs enter into a Consent Decree to perform OU I ROD.
9/28/90	EPA issued a Record of Decision (ROD) for OU II of the Site.
5/91	EPA and PRPS enter into a Consent Decree to perform OU II ROD.
4/92	Remedial Design (RD) for OU I completed.
6/92	Remedial Action (RA) for OU I initiated.
5/93	RD for OUII completed.
9/93	Construction of OU I completed.
6/94	Construction of OU II completed.
9/94	Preliminary Close Out Report (PCOR) and Interim Remedial Action Reports for OU I and OU II completed.
1994-present	Operation and maintenance of OU I and OU II RA by PRPs with EPA oversight.
1998	First five year review completed.

3.0 BACKGROUND

The 10 acre Old Springfield Landfill (hereafter referred to as "the Site") is located approximately one mile southeast of the city center in the Town of Springfield, Windsor County, Vermont. The 1980 National Census lists the population of the Town of Springfield at 10,180. The Villages of Goulds Mill and Hardscrabble Corner are located within a one-mile radius of the site. The Old Springfield Landfill was also referred to as the Will Dean Dump, was operated by the Town of Springfield between 1947 and 1968. Hazardous industrial waste from local industries was co-disposed with municipal trash. The industrial waste was disposed both in discrete trenches and mixed with municipal solid waste. Most hazardous material was disposed in bulk liquid and semi-liquid form. After the closure of the landfill in 1968, it was sold and developed for use as a mobile

home park, known as the Springfield Mobile Home Estates. At the time of the mobile home park's development, the Vermont Department of Health (DOH) recommended that drilled wells not be used to supply water to the mobile homes because the development was located over areas that had been used for chemical disposal. Municipal water lines were extended to serve the mobile homes. Springfield Mobile Home Estates is no longer occupied and the mobile homes have been removed. Only a caretaker for the estate of John Curtin, the owner of the property, still resides on the site. A six-building condominium complex and 13 single family residences are located in the immediate vicinity of the site.

3.1 Physical Characteristics

The Site is situated on an upland plateau with slopes that descend steeply to the north, east, and west. Seavers Brook runs west of the site and the Black River runs east of the site. Seavers Brook flows northward until it reaches the Black River, which flows to the south and empties into the Connecticut River. Will Dean Road is located along the western side of the site. Will Dean Road intersects Route 11 just north of the site. Route 11 runs along the eastern side of the site.

3.2 Land and Resource Use

The land use within a one-mile radius of the site is primarily low density residential housing, light agriculture, undeveloped forest land and commercial. Approximately 200 homes and condominiums are located within a one-mile radius of the site, housing an estimated population of between 650 and 750 people.

Natural resources in the vicinity of the site include groundwater, surface water, fish and game, arable land, forest, woodland and minerals.

All other residents in close proximity to the Site receive municipal water from the Town of Springfield. A bedrock aquifer is a current source for drinking water in the area for those individuals not part of the municipal water supply system. Users of the bedrock aquifer groundwater in the site vicinity are located primarily upgradient of the Site. Groundwater monitoring wells are located between the Site and current users of the bedrock aquifer. Figure 1 shows the Site and location of the Town water supply line.

3.3 History of Contamination

The Site was operated by the Town of Springfield between 1947 and 1968. Hazardous industrial waste from local industries was co-disposed with municipal trash. The industrial waste was disposed both in discrete trenches and mixed with municipal solid waste. Most hazardous material was disposed in bulk liquid and semi-liquid form.

Shortly after the opening of Springfield Mobile Home Estates, a nearby resident's complaint about foul-smelling water prompted an investigation of the site by the Vermont DOH and the Vermont Agency of Environmental Conservation (VTAEC). In response to finding volatile organic compound contamination in a spring located near Seavers Brook and in the residential well near the mobile home park, the spring was abandoned and the affected home near the mobile home park was connected to the public water supply.

3.4 Initial Response

In 1984, the PRPs installed a water line. EPA then performed a remedial investigation and feasibility study. In 1988, EPA signed the first Record of Decision for the Site to initiate a cleanup action for the contaminated groundwater and seeps. In 1990, EPA signed the second, and final, Record of Decision to address the landfill closure.

3.5 Basis for Taking Action

The Human Health Risk Assessment for the Old Springfield Landfill documented an unacceptable threat to human health based on:

- Future potential ingestion of groundwater contaminated with vinyl chloride, trichloroethene, tetrachloroethene, dichloroethene, and methylene chloride.
- Current and future potential exposure to landfill waste and soil containing polychlorinated biphenyls (PCBs) and polycyclic aromatic compounds (PAHs)

4.0 REMEDIAL ACTIONS

4.1 Remedy Selection

The cleanup action for the Site has been implemented in two Operable Units.

The Remedial Action Objectives for the first Operable Unit (OU I) are:

> Prevent direct contact (incidental ingestion and dermal absorption) with contaminated surface soils throughout the site by residents and by construction workers;
>
> Prevent the volatilization of contaminants from contaminated soils, wastes, and leachate seeps;
>
> Prevent the contamination of fish in the Black River by preventing leaching of contaminants from the site soils to shallow groundwater to the bedrock aquifer with subsequent discharge to Seavers Brook and into the Black River; and

Prevent the leaching of contaminants from site soils to shallow groundwater with subsequent transportation from the shallow groundwater to the potable bedrock aquifer.

To meet these remedial action objectives, the OU I Record of Decision required the design and construction of:

(1) two groundwater extraction wells;
(2) a collection system for three areas of contaminated seepage, two on the east side of the Site at the base of Waste Areas 2 and 3, and one on the west side along Seavers Brook Road; and
(3) a pre-treatment facility for discharge of collected water to a POTW.

The OU I Record of Decision also included the implementation of Town of Springfield Municipal Ordinance 88-2 as an institutional control to prevent future use of the groundwater. The OU I Record of Decision did not address the closure of the landfill.

To complete the remediation of the Sit, EPA signed Record of Decision to implement a second Operable Unit (OU II) in September 1990. The Remedial Action Objectives for OU II are:

Prevent the leaching of soil contaminants to the groundwater;

Prevent the migration of contaminated groundwater to the rest of the aquifer;

Prevent contact with contaminated soil or leachate that present a risk;

Prevent further migration of contaminated groundwater offsite; and

Prevent the uncontrolled emission of landfill gases containing hazardous substances.

To meet these remedial action objectives, the OU II required the design and construction of:

(1) a third groundwater extraction well;
(2) upgradient french drains and surface water diversions; and
(3) a multi-layer landfill cap with gas vents.

The OU II Record of Decision also required the application of Municipal Ordinance 88-2 to the area to be capped. Long-term operation, maintenance, and monitoring of the remedial actions were requirements of the OU I and OU II Records of Decision.

4.2 Remedy Implementation

The remedial design process for OU I was completed in April 1992. The final design required the construction of a pre-treatment facility with two air strippers, metals pre-treatment, and carbon treatment of the air emissions. The PRP contractor, REMCOR, mobilized to the Site on June 1, 1992. Construction activities for the ground water extraction wells, west side seepage collection system, and pre-treatment facility were completed by February 8, 1993. The east side leachate collection system was delayed until placement of the cap. The start-up testing and performance testing of the collection systems and pre-treatment facility were completed by February 28, 1993. The pre-treatment system successfully passed the hydraulic and analytical performance tests. The east side collection system and additional extraction well were completed June 18, 1993 and performance testing for the source control well and eastern seep collection system was completed on August 8, 1993.

The construction completion of OU I collection systems and pre-treatment facility were documented in the Remedial Action Report for OU I, September 1993. This Report was approved by EPA on September 30, 1993. EPA and the oversight contractor performed a final inspection on September 16, 1993.

Sample results and water level measurements demonstrate that OU I is meeting the ROD objectives of controlling groundwater flow and meeting the pre-treatment requirements of the POTW. The goal of containment of the groundwater has been met. The long-term goal of groundwater restoration will not be achieved for many years. The OU I remedial action has also achieved control over the landfill seeps. These seeps are now collected and pumped to the pre-treatment facility and then discharged to the POTW.

The final design of OU II was complete May 1993. As part of the pre-design activities a pre-load of common borrow soil was placed on Waste Area 4 in the fall of 1992 to reduce long-term settlement of the waste material. The PRPs contractor, REMCOR, mobilized to the Site in May 1993. Two french drains were installed, one upgradient of Waste Area No. 4 and the other upgradient of Waste Area No.3, using a bio-polymer slurry technique during June 1993. Cap construction was initiated in July 1993. The cap included a 12 inch gas vent layer, geosynthetic clay liner, 40 mil VLDPE geomembrane, 12 inch sand drainage layer, 36 inches of frost and erosion protection, and 6 inches of top soil. Passive gas vents with carbon treatment canisters attached were installed. The cap on the steep slopes consisted of a 40 mil textured geomembrane over common borrow. The layers above the geomembrane were the same as the previously discussed. Construction activities were completed in November 1993. EPA and the oversight contractor performed a substantial completion inspection in December 1993. In April 1994 a retention pond overflowed due to a construction defect. This defect was corrected by changing the design of the discharge pipe and installing a new overflow channel. In addition, areas of erosion were repaired and re-seeded in June 1994.

EPA and the oversight contractor performed a final inspection of OU II on June 30, 1994. The cap, source control well, french drains, and surface water diversions were determined

to be constructed according to design with some minor erosion and sparse vegetation noted. On August 11, 1994, based upon an EPA follow-up inspection, the landfill was determined to have a well established grass cover in all areas. The french drains and cap have been successful in reducing the saturation of the waste material as measured by piezometers below the waste. A Remedial Action Report for OU II was completed in September 1994. A Preliminary Close Out Report (PCOR) for Operable Units I and II was completed in September 1994.

The remedial action has been completed and is considered operational and functional as of the PCOR and Interim RA Reports in 1994. The long-term remedial action will be operated and maintained for at least thirty years by the PRPs as required by the two consent decrees. In reality, the operation and maintenance will continue in perpetuity. The Town of Springfield is performing the operation and maintenance actions. Institutional controls required by OU II have been fully implemented and the institutional controls required by OU I have been partially implemented. The Town of Springfield has restricted use of the property containing the cap and treatment facility.

A final Remedial Action Report will be prepared once the remedial has achieved the ground water cleanup goals established in the OU I and OU II RODs. The final Remedial Action Report will support the final Superfund Site Closeout Report to document the completion of all cleanup activities.

4.3 Operation and Maintenance

The Town of Springfield, VT is conducting long-term monitoring and maintenance activities according to the Operation and Maintenance (O&M) Plan and the Long-term Monitoring Plan. The primary activities associated with O&M and long-term monitoring include:

- Routine inspection and maintenance of the landfill cover system, extraction wells, French drains, water treatment system
- Periodic sampling of the groundwater, treatment plant influent and effluent, ambient air within treatment plant, and air discharge from carbon units
- Submission of an annual Report to EPA and Vermont DEC to document the performance of the O & M and present the sampling results.

EPA's oversight contractor, TRC Solutions, Inc., performs semi-annual inspections of the Site as part of the oversight of the Town of Springfield.

5.0 PROGRESS SINCE LAST REVIEW

This is the second Five-Year Review for the Site. The previous Five-Year review was completed in September 1998. Significant activities completed since the last five-year review included the following:

- Revision of the Operation and Maintenance Plan to reflect changes in operating procedures.
- Replacement of the bulk carbon canisters with carbon drums to provide more cost effective treatment of the air effluent from the air stripper.
- Repair of several areas of slope instability (adjacent to the cap)

6.0 FIVE-YEAR REVIEW PROCESS

6.1 Administrative Components

EPA, the lead agency for this five-year review, notified VTDEC and the PRPs in early 2003 that the five-year review would be completed. The Five-Year Review Team was led by Edward Hathaway of EPA, Remedial Project Manger, for the Old Springfield Landfill Superfund Site, and included staff from EPA's oversight and five year review support contract TRC Solutions Inc. Brian Woods of the Vemont DEC was as also part of the review team.
The review components included:

Community Involvement;
Document Review;
Data Review;
Site Inspection;
Local Interviews; and
Five-Year Review Report Development and Review.

.

6.2 Community Involvement

EPA issued a fact sheet that was mailed to the residents within one-half mile of the Site and made available to the general public at the Town Hall. The fact sheet described the Five-Year Review process and how the community can contribute during the review process. EPA did not receive any comments regarding the protectiveness of the remedial action.

6.3 Document Review

The five-year review consisted of a review of relevant documents including O&M records and monitoring data. Applicable or relevant and appropriate requirements (ARARs) in effect at the time of the ROD were also reviewed. A list of the documents reviewed is attached.

6.4 Data Review

Monitoring data presented in the Annual Operations and Maintenance Reports for the Site for the following years: 1997, 1999, 2000, 2001 and 2002 was reviewed as part of the five year review. A summary of the reviewed data is presented below.

Groundwater Monitoring Data

During the five-year review period, groundwater quality at the site has been monitored in 10 monitoring wells and three extraction points on an annual basis for Target Compound List (TCL) VOCs and metals (iron, manganese, molybdenum, mercury and sodium).

Metals in Monitoring Wells

There are no site-specific cleanup levels for metals in site groundwater. Conservatively, MCLs are used to evaluate monitoring results. A review of the 2002 groundwater quality data indicates that only three TAL metals (iron, manganese and/or sodium) were detected above the laboratory quantitation limits. Of the metals detected, MCLs have not been established and only iron and manganese have non-enforceable secondary drinking water standards of 300 ug/L and 50 ug/L, respectively. Iron and/or manganese exceeded the secondary standard in only four of the 10 monitoring wells (MW-20, MW-41B, MW-41G and MW-45B). The highest iron (3200 ug/L) and manganese (1500 ug/L) concentrations were detected in the 2002 sample from monitoring well MW-41G.

VOCs in Monitoring Wells

Prior to the implementation of the groundwater treatment system, more than eight VOC analytes were previously detected in monitoring well samples at levels exceeding maximum contaminant levels (MCLs). These contaminants include vinyl chloride, methylene chloride, 1,1-dichloroethene, 1,2-dichloroethene (1,2-DCE), 1,1,1-trichloroethane, trichloroethene (TCE), tetrachloroethene, and acetone.

During 1998, three VOC analytes were detected in groundwater samples at concentrations exceeding the site-specific MCLs. These contaminants were vinyl chloride, 1,2-DCE, and TCE. The most recent (2002) round of groundwater monitoring results indicate that only these three contaminants continue to be detected at concentrations exceeding the MCLs. Therefore, it appears that the number of VOC contaminants in groundwater exceeding MCLs has remained stable and did not increase over the past 5 years.

Concentrations of VOCs have been generally decreasing in most of the wells monitored. However, groundwater data from 1998 to 2001 shows a sudden and noticeable increase in concentrations of certain VOCs (i.e., vinyl chloride, 1,1-DCA, 1,2-DCE TCE, and acetone) in bedrock well MW-45B. During the most recent (2002) monitoring round, the concentrations of these VOCs decreased to concentrations more consistent with historic levels, indicating that the previous increases in VOC levels in this well may have been a temporary, seasonally-influenced or non-significant trend. However, the VOC concentrations in this downgradient bedrock monitoring well should be examined in the future for indications of further increases that may indicate the off-site migration of contaminants.

VOCs in Extraction and Source Control Wells

The extraction wells (EW-1 and EW-2) remove groundwater from the subsurface sand and gravel unit for the purpose of containing contaminated groundwater to the site boundary, and minimizing the migration of contaminants to the discharge point at the Western Seep. Historically, only one or two VOCs have been detected at low levels in EW-1, while EW-2 contributes a majority of contaminants removed at the PTF. In general, the number of contaminants and the concentrations of contaminants in EW-1 and EW-2 has decreased or remained stable over time (since 1993). This data, in part, indicates these extraction wells are effectively and consistently removing contaminated groundwater from the sand and gravel layer, and controlling migration of contaminants to the Western Seep.

The source control well (SC-1, or EW-3) removes groundwater from the weathered bedrock layer that slopes towards the east, below the site, thereby minimizing migration of contaminated groundwater towards the Black River and the eastern seeps. While the number of contaminants detected has remained stable or increased, the concentrations of contaminants in SC-1 appear to have decreased over time (since 1994). An increase in the number of compounds detected may indicate that degradation products are becoming more prevalent, and that SC-1 has remained effective in capturing contaminated groundwater entering the

bedrock layer. In addition, decreasing contaminant concentrations in SC-1 indicate the treatment system, combined with the effectiveness of other source controls (i.e., the cap, French drains, etc.) is limiting the migration of contamination into the bedrock layer and towards the Black River.

Samples are collected annually from EW-1, EW-2 and SC-1 and analyzed for TCL VOCs. In 1998, five VOCs (methylene chloride, vinyl chloride, 1,1,1-trichloroethane, trichloroethene, and tetrachloroethene) were detected in both EW-2 and SC-1 at concentrations at or exceeding their MCLs. In addition, trichloroethene was detected in EW-1 at a concentration exceeding its MCL.

In 2002, 1,1,1-trichloroethane concentrations in EW-2 and SC-1 decreased to below MCLs, but the four other VOCs listed for 1998 (vinyl chloride, 1,1-dichloroethene, trichloroethene and tetrachloroethene) were again detected in both samples at concentrations exceeding the MCLs. In 2002, two VOCs (trichloroethene and acetone) were detected in the EW-1 sample, but at concentrations below the MCL, where applicable.

French Drain Monitoring

Water samples are collected on an annual basis in three French drain valve and meter vaults at the site and analyzed for TCL VOCs. The purpose of the French drains is to intercept off-site groundwater before it enters the landfill mass. Flow from the French drains appears to be seasonally influenced (higher flows during the wetter spring months). This is consistent with the objective of intercepting shallow overburden groundwater. Since the construction of the cap, VOCs have been sporadically detected in the French drain samples. The source of the VOCs may be small amounts of leachate from the adjacent waste areas. The presence of VOCs in the collected water is not a concern since the water is treated at the Pre-Treatment Facility and the POTW.

Groundwater Elevation Contours

Groundwater elevations measured in site monitoring wells during the past five years were reviewed to determine the highest and lowest water table events. The highest measured water table event during the five-year period occurred during May 2000, and the lowest measured water table event occurred during July 1999.

Groundwater elevations measured during the high and low events in bedrock wells and in overburden wells were each plotted on the site map to evaluate groundwater flow direction. Groundwater flow at the site generally occurs in a northeasterly direction below the cap and then in a more easterly direction, following the steep slope towards the Black River.

On the west side of the site, groundwater also flows in a westerly direction towards Seavers Brook. Overall, these elevations indicate a drop in water table elevation of over 200 feet from the top of the site to the base of the slope near the Black River. In general, the water table fluctuated approximately two feet in each well from the low to the high event.

Locally, it is assumed groundwater flow in the vicinity of the source control well and extraction wells (SC-1, EW-1 and EW-2) is influenced by the extraction of groundwater at these points. However depth to water measurements for these extraction points was not provided in the documents reviewed as part of this five-year review. Therefore, the groundwater contours derived in the vicinity of SC-1, EW-1 and EW-2 were based solely on groundwater elevations measured in nearby monitoring wells.

While the extent of the capture zone of EW-1 and EW-2 cannot be determined precisely from the available data, the lower water elevation at MW-41G indicates the extraction is lowering the water table in the local vicinity. The locally low water level at well MW-41B may also be an indication of drawdown caused by the source control well SC-1.

Surface Water Monitoring

Surface water controls for the site include the interception of seep water from 10 seeps identified on the eastern slope and 4 seeps on the western slope. The seep water is intercepted by a French drain system. The west seep French drain system accounts for a little more than half of the total collection system flow. A surface water collection system was installed to direct surface water runoff away from the waste areas and cap. Concrete and grass lined ditches direct stormwater to a claymax® lined holding pond designed for controlling a 100-year flood.

Naturally-occurring surface water bodies located in proximity to the site include Seavers Brook, located approximately 350 feet west of the Site, and the Black River, located less than 200 feet east (downgradient) of the Site. These surface water bodies are not sampled as part of site monitoring activities. However, the following reports by EPA dated 1999 were reviewed: "Lower Black River Assessment Report"; and "Minor Tributaries - Lower Black River Assessment Report" (Reports are included in Attachment 3). The first report discussed the section of the Black River nearest the Springfield, VT Wastewater Treatment Facility (which receives treated groundwater from the site), and the second report included a general discussion of Seavers Brook water quality impacts.

The first report noted that water quality in the Black River was threatened by algae, organic and nutrient enrichment and pathogens as a result of

Wastewater Treatment Facility discharges and road runoff from Route 11, but did not reference potential impacts resulting from site conditions. This report also noted that the site was capped and a groundwater pump and treat system was in operation since 1994, and that volatile contaminants from the identified landfill seeps were likely to volatilize before reaching the River, according to Matt Germon of VTDEC. The second report noted that water quality in Seavers Brook was threatened by sedimentation resulting from nearby encroaching developments, but did not mention potential impacts to Seavers Brook from the site.

Construction of the landfill cap and the collection and discharge of leachate to the POTW were designed to eliminate the discharge of contaminants to surface water receptors. With continued maintenance of the landfill cap and leachate collection system, future compliance regarding surface water and sediments can be expected without additional remedial action.

Extraction System Monitoring

Flow Monitoring

Flows at each of the seven groundwater and leachate collection points are measured continuously by digitized totalizing flow meters. A totalizing flow meter is also located on the downstream side of the equalization tank in the PTF. Leachate flow readings are recorded from meters at each collection point and the PTF influent on a daily basis, and this information is summarized in annual O&M reports for the site.

The design average flow rate for influent to the PTF is 87 gallons per minute (gpm). Historically, actual mean flows have been only about 25% of the design flow rate (around 21 gpm). EW-1 and EW-2 have accounted for a majority (about 75%) of the flow to the PTF. The remainder of flow into the PTF originates from the source control well, French drains 1, 2 and 3, and the eastern leachate seep collection system (LSE 3/4). The running average flow to the PTF (presented in Annual O&M Reports) suggests the flow rate has been fairly steady since 1996.

Flow rates in EW-1 and EW-2 decreased between 1994 and 1999 until new discharge piping was installed due to the build up of fouling agents. The flow rate increased after the new piping was installed and has decreased to pre-1999 levels in 2002. This suggests that the discharge piping has become fouled and should be either cleaned or replaced. Similarly the flow rate from the source control well increased after the replacement of the discharge piping and pump in 2001. The flow rate from SC-1 should be monitored in the future for indications of fouling or pump problems.

The flow rate from the eastern leachate seep collection system (LSE-3 and LSE-4) averages approximately 1.7 gpm. The flow rate varies over time and appears to be seasonally influenced (higher flow during the wet spring months).

The flow rates from the three French Drains average less than 1 gpm each. The flow rates also vary over time and appear to be seasonally influenced.

PTF Influent Concentrations

Quarterly analysis of the combined PTF influent water shows the presence of several VOCs including 11 chlorinated hydrocarbons, acetone, bromoform and MEK. Trichloroethene, vinyl chloride, 1,1-dichloroethene, tetrachloroethene, and methylene chloride are consistently detected above the drinking water standard. The majority of the contaminant load appears to from EW-2 and SC-1. On the other hand, contaminant concentrations in the discharge from EW-1 is consistently below the detection limit and only three concentrations exceeded the drinking water standard since 1993.

Seep Monitoring

An annual sample of the discharge from the Eastern Leachate Seeps (LSE-3 and LSE-4) is collected in the LSE 3/4 common valve meter vault. The LSE 3/4 samples are submitted for analysis of VOCs. In general, LSE 3/4 analytical results for the past 5 years show similar VOCs present in 2002 and at slightly higher concentrations than in 1997. Of the nine VOCs detected in the LSE 3/4 sample in 1997, two VOCs, vinyl chloride and methylene chloride, were detected at concentrations exceeding their MCLs. In 2002, 10 VOCs were detected in the LSE 3/4 sample. These VOCs included 1,1-DCE, tetrachloroethene, and TCE at concentrations above their MCLs, and vinyl chloride at a concentration equal to its MCL. In 2002, TCE was detected at an unusually high concentration (310 ìg/L), over 60 times its MCL. This concentration was well above the long-term average for TCE in the LSE 3/4 samples.

The Western Seep is sampled on a quarterly basis for VOCs and metals and annually for PCBs, pesticides and SVOCs. A review of analytical data from 1997 and 2002 suggests that contaminant concentrations are decreasing. During the 1997 annual sampling period, six TAL Metals were detected in the Western Seep sample (barium, calcium, manganese, magnesium, potassium, and sodium) at concentrations below drinking water standards. PCBs, pesticides, and SVOCs were not detected above laboratory reporting limits in the 1997 samples. One VOC (methylene

chloride) was detected in the summer, fall and winter 1997 quarterly samples, each time at concentrations exceeding its MCL.

In 2002, no VOCs were detected in the Western Seep sample in February and July, and up two three VOCs were detected at low concentrations (well below MCLs) in March and October. Therefore, VOC levels in the Western Seep appear to have decreased over the past 5 years.

Two new seep samples were collected on May 29, 2003. One sample was collected from a new seep (LSE-1A) in a sinkhole area located approximately half way between LSE-01 and LSE-02. A second sample ("Headwall") was collected from a suspected seep, where water was flowing over the concrete lining at the junction of two fabriform ditches near the southeast corner of the site. In addition a third sample was collected from the LSE-02/Station 2 seep location at the request of EPA. The May 2003 seep samples were submitted for analysis of Target Analyte List (TAL) Metals and VOCs.

VOCs were not detected above the laboratory's method detection limits in either the LSE-1A or the LSE-02 samples. Acetone and methylene chloride were detected in the Headwall sample, but at concentrations below applicable MCLs.

Metals were not detected at concentrations exceeding applicable MCLs in the Headwall sample. Antimony was detected at concentrations of 8.2 and 7.4 ug/L, in the new seep (LSE-1A) and Station 2 (LSE-2), respectively. These concentrations exceed the MCL of 6 ug/L for Antimony. Concentrations of this metal previously did not exceed the MCL in the seeps sampled during the five-year review period or before. Only methylene chlorifde was detected at an estimated concentration of 1 ug/L in the Headwall and LSE-1A samples.

System Performance Evaluation

Overall, the Remedial Action components have been performing as expected.

Cap and French Drains

The remedial objectives of the cap have been achieved by preventing direct exposure to waste and contaminated soils and controlling gas emissions. There is no indication that the cap is leaking, therefore, the objective of reducing or eliminating the generation of landfill leachate has been met. The cap is well-maintained, and is periodically inspected and repaired as necessary.

Two French drain systems were constructed to intercept upgradient, overburden ground water and prevent it from entering the wastes of Waste areas 3 and 4. The

French drain systems extend to about 25 feet below ground surface (bgs) and are designed to intercept shallow groundwater that may migrate along the top of till. Water collected in the French drain sumps is pumped to the PTF.

The running average flows in the French drains have remained fairly steady since 1995. Monthly flows in the French drains vary, apparently due to seasonal fluctuations in the shallow groundwater table. The overall steady average flow in the French drains indicates the French drain system is operating reliably and as intended.

Extraction Wells

The groundwater extraction system includes two groundwater extraction wells (EW-1 and EW-2). These extraction wells were installed in the vicinity of Waste Areas 3 and 4 to extract contaminated groundwater from the shallow sand and gravel layer that exhibits a preferential gradient towards Seavers Brook and the Western Seep. Extracted groundwater is routed to the PTF prior to being conveyed to the POTW. About half of the water received at the PTF is derived from these extraction wells.

While the degree of containment is uncertain, groundwater elevations in the vicinity of the extraction wells indicate localized groundwater containment. Additional evidence of groundwater containment is the decreasing contaminant trends in wells MW-41G and MW-52G. Contaminant concentrations have been below the MCL in MW-41G since 1998 and the regression analysis presented in the Technical Memorandum in support of the five-year review prepared by TRC Solutions Inc, in September 2003, documents decreasing trends for vinyl chloride, 1,2-Dichloroethene, and TCE at well MW-52G. Both of these wells are located within the sand and gravel unit near or downgradient of the extraction wells.

The concentrations of chemicals of concern at the site have basically stabilized. The primary contaminant of concern, trichloroethene, remains at a concentration of about 1 ppm at the influent to the PTF, which is at a level about 200 times the potable groundwater standard. Declines in well concentrations over time should occur as the source material is depleted, by natural degradation, by sorption to organic matter, natural chemical reactions, dispersion and capture by the treatment system.

The steady concentration of TCE in groundwater may be due to the presence of free product TCE in the ground, also referred to as dense nonaqueous phase liquid (DNAPL). The natural biodegradation of TCE to vinyl chloride and 1,2-DCE likely accounts for their presence at stable levels in groundwater. The slow steady leaching of TCE DNAPL and desorption from the matrix rock will likely continue at the site for tens of years or longer.

In general, the groundwater extraction system appears to be functioning as originally approved in 1994 and is consistent with its intended purpose of groundwater containment. Continued monitoring at remote monitoring wells and continued operation of the leachate and groundwater recovery system will ensure the effectiveness of the groundwater containment system.

Source Control Well

The source control well, SC-1 (also referred to as EW-3) is located within Waste Area 3 to extract contaminated groundwater from the underlying weathered bedrock formation. SC-1 was configured to target the bedrock groundwater that would otherwise flow downgradient (over the steep bedrock incline) towards the Black River. Groundwater that is recovered in SC-1 is pumped to the PTF prior to being conveyed to the POTW.

In general, the running average flow in SC-1 decreased gradually from 1995 to 2000, and has been increasing slightly since 2000. In particular, daily flows have been slightly higher, overall, since July 2001. The reason for this increase is unclear, but could be related to the replacement of the pump in SC-1 in 2001.

Based on the regression analysis performed by TRC, concentrations of contaminants are not increasing with time at well MW-45B. This suggests that no additional contaminants are migrating from the site through the upper weathered bedrock to the west. Ultimately the groundwater contamination in well MW-45 is expected to discharge into the Black River and become highly diluted and likely below aquatic risk levels. In any case, the nearby residences are on a public water supply and are therefore protected from groundwater consumption exposures.

Western Leachate Seep

The Western Seep refers to groundwater that formerly discharged to the ground surface to the west of the site, near Seavers Brook. Prior to the implementation of the remedy, it was found that this groundwater was contaminated with landfill related contaminants. The source of the Western Seep appears to be the sand and gravel unit present in the waste areas that has a hydraulic gradient to the west. To prevent human contact and/or ingestion with this seep, groundwater is intercepted at the Western Seep via a French drain and is discharged to the POTW untreated. The leachate and groundwater quality is monitored and reported in accordance with the POTW permit for volatile organic compounds, total metals and alkalinity/conductivity.

As a result of the operation of the Western Seep collection system, the Western Seep has been effectively captured and is no longer exiting at the ground surface. Running average flow rates for the Western Seep collection system show a sharp decrease in flow in 1993. Flows have remained steady since 1994 (around 26 to

27 gallons per minute). This may suggest that the flow to the Western seep was affected by the groundwater extraction system within the landfill.

Eastern Leachate Seeps

The capture and treatment of two primary leachate seeps, located on the east side of the landfill, was included as part of the remedy. These eastern leachate seeps, LSE-03 and LSE-04, were formerly located near the middle of the steep slope on the eastern side of the landfill. A French drain collection network with two sumps (LSE-03 and LSE-04) was installed in 1993 to collect the eastern seeps and convey them to the PTF for treatment prior to being discharged to the POTW. The combined flow from LSE-03/04 is measured in their shared meter vault.

The fact that no new seeps have developed in the area of LSE-3 and LSE-4 indicates the collection system is effectively capturing the leachate and preventing the leachate from impacting surface water resources.

A new small seep has developed on the eastern slope where the two fabriform concrete-lined ditches converge. This flow was observed by TRC, Dufresne-Henry and EPA during a site visit in May 2003. The flow rate of the seep could not be estimated accurately, but appeared to be less than 1 gallon per minute. The new seep has likely developed because the concrete lining prevents normal discharge of shallow groundwater into the drainage channels. Therefore, shallow groundwater would tend to concentrate at the convergence of the two fabriform channels. Samples show moderate levels of some leachate indicators (i.e., iron and manganese). However, flow from the new seep is low and contaminants will be highly diluted in the receiving surface water (Black River).

Air Monitoring, Emissions, and Compliance

The landfill gas vents and an air stripper used as part of the contaminated groundwater treatment system emit some contaminants to the ambient air. Analytical data for landfill gas samples collected by the PRP in 2001 were evaluated to identify any applicable air regulations.

Potential Landfill Gas Emission Routes to the Atmosphere

The landfill vents extend to some depth below the landfill cover to provide an outlet for gases generated in remaining waste. The vents help to minimize the amount of potentially explosive methane gas in the landfill, a major constituent of landfill gas.

The groundwater treatment system at the site employs an air stripper where volatile and, to a lesser degree, semi-volatile contaminants are preferentially transferred from liquid media (groundwater) to gaseous media (air) within the stripper. The contaminant-bearing air stream is then passed through a carbon bed

where the contaminants adhere to the carbon. The carbon beds are changed periodically to minimize breakthrough, noted as a sharp increase in the levels of one or more contaminants in the exhaust air.

Emissions Data

Air emissions test data were obtained by the PRP's contractor in 2001. Test results for the air stripper compared influent and effluent concentrations for target analytes along with respective Vermont Hazardous Ambient Air Standards (HAAS) and "potential release" estimates for 8-hour periods. Results for each landfill gas vent are compared the HAAS and NIOSH 8-hour TWA but do not include any exhaust flow data.

6.5 Site Inspection

Summary of Current Site Inspection

EPA, Vermont ANR, a representative for the EPA technical consultant TRC, and the technical consultant for the Town of Springfield, Dufrense and Henry, performed an inspection of the Site on May 21, 2003.

In addition, the results of the semi-annual inspection of the Old Springfield Landfill performed on April 18, 2003 is summarized below.

The inspection was performed as part of the semi-annual inspection and also the Five-Year Review for the landfill. A Five-Year Review checklist was used to document the observations made during the inspection. The report is based on observations made by TRC during the visual inspection of the landfill surface. No testing was performed on components of the landfill system.

TRC inspected components of the landfill cover system, as summarized below.

- **Landfill surface –** The landfill surface was generally in good condition with some rodent holes on Waste Areas 3 and 4.

- **Fabri-Form Channels–** Overall, the three Fabri-Form channels were observed to be in good condition. A slight separation was observed at a seam in the Fabri-Form material in the southern channel. A cavity was present in the soils next to the seam, where runoff was entering the cavity from off the cap. Repair of the channel was recommended to prevent further degradation of the Fabri-Form channel.

- **Cover penetrations –** In general the gas vents and gas vent sheds were in good condition with no signs of operational issues. However, rodent damage, including mounded soil and displaced insulation, was observed in many of the sheds. TRC

recommended removal of the mounded soils and continued rodent control measures. The O&M staff indicated that they planned to install concrete floors in the gas vent sheds in the next year. This should not affect the performance of the gas vents.

- **Cover drainage layer –** The drain pipe outlets for the drainage layer into the Fabri-Form channels appeared to be in good condition and flowing freely.

- **Detention/Sedimentation Basin –** A recent slope failure was observed on the western sidewall of the detention basin, near the southwest corner. The Geosynthetic Clay Liner appears to be degraded and is promoting infiltration of water into the soils underlying the basin. Due to sidewall erosion that has occurred in the past (2001-2002), TRC recommended that the GCL below the detention basin be replaced, and that the sidewall be repaired.

- **Groundwater systems –** The above ground portions of the systems were in good condition. At the time of the inspection, the granular activated carbon units in the PTF were being replaced.

Recommendations of corrective actions based on the inspection included the investigating the cause of the seep and repairing related erosion in the detention basin, repair of the split in the southern Fabri-Form channel, continued monitoring and removal of sediments and vegetation in the channels, and continued rodent removal on the cap. The overall conclusion based on the site inspection is that the components of the landfill cover system are working as designed, with the exception of the detention basin.

Past Inspections

Semi-annual inspections of the Old Springfield Landfill have been conducted by TRC since November 1999. There have been no major issues regarding the operation and maintenance of the landfill remedial system. Operations, maintenance, and monitoring have adequately established the landfill cap integrity, leachate collection, and groundwater extraction systems continued operation.

6.6 Interviews

On May 21, 2003, Ed Hathaway of EPA and Brian Woods of Vermont DEC met with the operators for the Old Springfield Landfill remedial action, the Director of the Springfield Department of Public Works and the Town Manager. The interview indicated there were no major concerns about the site and that there is minimal public interest regarding the Site at this time.

In addition, During the semi-annual inspection of the Old Springfield Landfill on April 18, 2003, Amy Stattel of TRC interviewed Mr. Rick Chambers, Chief Operator of the Town of Springfield Wastewater Treatment Plant/Publicly-Owned Treatment Works

(POTW). Mr. Chambers, on behalf of the POTW, oversees the operations and maintenance of the landfill on an ongoing (almost daily) basis. Mr. Chambers was at the site on the day of the inspection to answer TRC's questions and to oversee the replacement of the granular activated carbon units at the PTF.

TRC asked if there were any outstanding operational/maintenance issues to be aware of during the semiannual inspection. Rick indicated that a system alarm was currently sounding at the pre-treatment building control panel due to defective pump in groundwater pumping well LSE-3 (manhole P4). He indicated that the pump would be replaced the following week (week ending 4/25/03).

TRC asked what the flow has been from the pretreatment building to the POTW (given the snowmelt from winter 2002/2003 and the heavy spring 2003 rains). Mr. Chambers indicated that the total flow (2003, to-date) was currently at 30,000 gallons as of April 2003, and that the site discharge permit is for 75,000 gallons annually. He also indicated that the total flow for fall/winter last year was only 18,000 gallons, so the total annual flow last year was well below the permitted annual flow.

On July 23, 2003, TRC contacted Rick Chambers via telephone for a follow-up interview. TRC asked about maintenance events in the last year that may have influenced flow. Rick indicated that the pump in LSE-3/P4 (pump was malfunctioning during TRC's Spring 2003 Inspection) was replaced at the end of April 2003. Rick also indicated that the switch meters are cleaned periodically due to fouling, but that this activity has a temporary effect only on localized flow; not total flow. Also, they plan to gradually replace all of the iron extraction system lines (2 or 3 per year) with plastic pipes to decrease clogging (some already replaced). Other periodic flow-maintenance activities performed by the POTW staff include periodic replacement of the screens at the ends of the lines to the french drains because they tend to get clogged.

7.0 TECHNICAL ASSESMENT

7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

Remedial Action Performance

The work performed during production of this memorandum indicates that the remedy is functioning as intended. The information sources include review of the available documents and data, trend and statistical analysis of groundwater, the interview, and the site inspection. The landfill cap, and the O&M of the leachate seep collection and groundwater extraction systems have achieved the remedial objectives: to minimize the migration of contaminants and prevent direct contact with or ingestion of contaminants. Based on the fairly consistent detection of

VOCs in perimeter monitoring wells over the past five years, and the slowly decreasing concentrations, the long term goal of groundwater restoration at the site will likely not be achieved for many years.

The lack of statistical trends in VOC concentrations in a few wells (i.e., MW-45T and MW-45B) warrant close monitoring in future inspections and data reviews to evaluate whether the migration of impacted water off-site is increasing or additional hydraulic controls may be considered to ensure the capture of landfill contamination. These wells monitor the deep-aquifer groundwater that flows east towards the Black River.

The presence of leachate indicators (manganese and iron) at low concentrations in new seeps does not warrant additional sampling.

System Operations/O&M

Operation and maintenance of the cap and leachate seep collection and groundwater extraction systems has been, and continues to be effective. Issues identified during the semi-annual site inspections are regularly addressed or continue to be monitored.

Groundwater flow and potentiometric surface is currently measured at only seven bedrock wells and 14 overburden wells. Only one bedrock well (MW-45B) located on or at the base of steep eastern slope (downgradient of wastes) is included in groundwater elevation measurements, to monitor the hydraulic gradient related to the weathered bedrock unit that flows towards the Black River. Also, only one overburden well is measured within the sand and gravel layer to the west of the landfill, where shallow groundwater tends to flow towards the Western Seep. To more accurately evaluate groundwater flow and the effectiveness of the groundwater containment system (source control and extraction wells), it would be useful to add groundwater elevations from deep wells on the west slope (e.g., MW-42T, if serviceable) and from available shallow wells on the east side of the site, between the extraction wells and the Western Seep (e.g., MW-29, MW-15). Water levels in the extraction wells (EW-1, EW-2 and SC-1) should also be measured at least once per year in order to evaluate drawdown and capture at the wells.

Opportunities for Optimization

The groundwater extraction system is the only system at the Site where optimization is possible. The low level of contaminants in the discharge of EW-1 indicates extraction at that point is not needed, or the extraction rate is too high causing excessive amounts of clean groundwater to be drawn into the well. If optimization is attempted, the EW-1 flow rate should be reduced gradually over a period of months. The concentration in the discharge should be monitored periodically until the contaminant removal rate is maximized. Groundwater in the

sand and gravel unit should be monitored quarterly, if not monthly to ensure that contaminant concentrations do not increase indicating a decrease in the extraction well capture zone.

Early Indicators of Potential Issues

One indication of a potential performance deficiency in the remedy is the lack of statistical trends (continued detection) in VOC concentrations in monitoring wells MW-45T and MW-45B. The data should be monitored for an increasing trend that may indicate VOCs in the weathered bedrock unit are bypassing the source control well and migrating to the east towards the Black River.

Implementation of Institutional Controls and Other Measures

Institutional controls implemented at the site include the fencing of the landfill to limit access and exposure, limited development within the fence line, the restriction of groundwater use by the Town of Springfield outside the fence enclosing the cap, and a public water supply provided to nearby residents. No activities were observed that would have violated the institutional controls.

Is There a Need to Update any of the Monitoring Plans used to Evaluate the Performance of the Remedy?

A review of the sampling and analytical procedures was conducted to determine the need to update any of the monitoring plans used to evaluate the performance of the remedy. Consideration should be given to supplementing the number of groundwater elevations measured and improving accuracy in evaluating groundwater flow by adding additional wells.

7.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives Used at the Time of the Remedy Selection Still Valid?

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The exposure assumptions used to develop the Human Health Risk Assessment included:

(1) ingestion of groundwater;
(2) direct contact with leachate;
(3) inhalation of the contaminants from the soil, groundwater, surface water, and leachate by workers or other individuals, and
(4) consumption of fish.

No individuals are currently exposed to contamination groundwater. With the expansion of the public water supply, and completion of the landfill cap, leachate collection system, and security fence, exposure assumptions 1 – 4 above have

been addressed. The potential ingestion of contaminated fish remains the only valid exposure scenario. The intent of the remedial action with respect to exposure assumption 4 was to prevent the migration of contaminants that could bio-accumulate in fish tissue. The landfill cap prevents the migration of those contaminants into the Black River. The contaminants contained with the groundwater are volatile and are not considered to be a concern with respect to fish ingestion. The exposure pathways used at the time of remedy selection are still valid.

While there have been some changes to the toxicity data used to develop the human health risk assessment, the cleanup levels are set at MCLs. The MCLs for the established cleanup levels have not changed since the signing of the Records of Decision. The Remedial Action Objectives and Cleanup levels are still valid.

Changes in Standards and To Be Considereds

Applicable or relevant and appropriate requirements (ARARs) were evaluated as part of the 1988 and 1990 Records of Decision. There have no changes to ARAR or To Be Considered requirements that would call into question the protectiveness of the remedy. The cover system would comply with all current regulations and guidance. The water treatment operates under a State of Vermont discharge permit that is periodically updated. .

7.3 Question C: Has Any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

From all of the activities conducted as part of this five-year review, no new information has come to light which would call into question the effectiveness of the remedy. No new human or ecological receptors have been identified at this time. No evidence of significant damage due to natural disasters or lack of maintenance was noted during the site inspection.

8.0 ISSUES

There are no major issues to be addressed. EPA and Vermont ANR will continue to perform periodic inspections to indicate areas where maintenance may be necessary.

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The recommendation and follow-up actions involve the continued oversight of the work being performed by the PRPs to assure compliance with the consent decree and Records of Decision requirements.

10.0 PROTECTIVENESS STATEMENT(S)

Because the remedial actions at this Site are protective, the Site is protective of human health and the environment.

- There is no current exposure of Site related waste to humans or the environment at levels that would represent a health concern.
- The landfill cover system prevent exposure to the waste material and contaminants with the landfill.
- The groundwater extraction system prevents the migration of the contaminated groundwater towards Seavers Brook.
- The water line has eliminated groundwater use within the area impacted by the landfill. The small quantity of contaminated groundwater that may be reaching the Black River is rapidly diluted by the flow of the Black River.
- PCBs and other constituents that would present a threat to biota in the Black River are not longer available for transport to the Black River via erosion as a result of the landfill cover.
- Landfill gas is treated with carbon drums and testing has confirmed that the levels do not represent an unacceptable risk.
- Extracted groundwater is being successfully treated by the groundwater treatment system and discharged in compliance with the NPDES permit.

11.0 NEXT REVIEW

The next five-year review will be conducted by September 2008.

Documents Reviewed:

- Dufresne-Henry, Inc., *Annual Operations and Maintenance Report with Appendices, (1997), Old Springfield Landfill, Springfield, Vermont,* March 31, 1998.
- Dufresne-Henry, Inc., *Annual Operations and Maintenance Report with Appendices, (1999), Old Springfield Landfill, Springfield, Vermont,* April 5, 2000.
- Dufresne-Henry, Inc., *Annual Operations and Maintenance Report with Appendices, (2000), Old Springfield Landfill, Springfield, Vermont,* March 28, 2001.
- Dufresne-Henry, Inc., *Annual Operations and Maintenance Report with Appendices, (2001), Old Springfield Landfill, Springfield, Vermont,* March 29, 2002.
- Dufresne-Henry, Inc., *Annual Operations and Maintenance Report with Appendices, (2002), Old Springfield Landfill, Springfield, Vermont,* May 4, 2003.
- Ebasco Services, Inc., *Draft Supplemental Remedial Investigation Report, Volume 1, Old Springfield Landfill Site, Springfield, Vermont,* February 1988.

- Remcor, Inc., *Final Submittal, Operation and Maintenance Manual, Site Collection and Pumping System and Pretreatment Facility (OU1), Old Springfield Landfill Site, Springfield, Vermont,* October 25, 1993.
- Remcor, Inc., *Long-Term Monitoring Plan (Years 3 and Beyond); Old Springfield Landfill Site, Springfield, Vermont,* March 31, 1993.
- Remcor, Inc., *Operations and Maintenance Manual, Operable Unit No. 2; Old Springfield Landfill Site, Springfield, Vermont,* August 24, 1994.
- Remcor, Inc., *Remedial Action Report, Operable Unit No. 2; Old Springfield Landfill Site, Springfield, Vermont,* August 26, 1994.
- TRC, *Technical Memorandum, 2001 Annual Operations and Maintenance Report (dated April 2002*) *for the Old Springfield Landfill, Springfield, Vermont,* July 19, 2002.
- United States Environmental Protection Agency, *Comprehensive Five-Year Review Guidance,* EPA 540-R-01-007, June 2001.
- United States Environmental Protection Agency, *Record of Decision, Operable Unit No. 1, Old Springfield Landfill Superfund Site, Springfield, Vermont,* September 1988.
- United States Environmental Protection Agency, *Record of Decision, Operable Unit No. 2, Old Springfield Landfill Superfund Site, Springfield, Vermont,* September 1990.
- United States Environmental Protection Agency, Superfund Preliminary Close Out Report (Operable Units No. 1 and No.2), Old Springfield Landfill Superfund Site, Springfield, Vermont, September 1994.
- United States Environmental Protection Agency, Five-Year Review Report, Old Springfield Landfill Site, Springfield, Vermont, September 1998.

ATTACHMENT 1

Dufresne-Henry North Springfield, Vermont Tel. (802)886-2261 www.dufresne-henry.com	SITE PLAN OF OLD SPRINGFIELD LANDFILL VERMONT SPRINGFIELD,	Proj. No. 4030002 Proj. Mgr. FDD Scale NOT TO SCALE Date JUNE 2003 A SP1